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ABSTRACT

A review of studies of four vocabulary teaching methods--context learning, imagery, cognitive style, and natural word learning--resulted in several generalizations about their effectiveness. The generalizations are limited by problems such as the difficulty of defining when a word is "known" and the lack of a way to test permanence of word knowledge and by the awareness that no one method of instruction has conclusively been demonstrated to be the best for all students. Future research studies might explore the benefits of teaching roots and affixes, the effects of word difficulty on students' learning, the degree of transfer of word knowledge learned in different media, and the importance of cognitive style in word learning before college. (AEA)

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VOCABULARY INSTRUCTION: THE STATE OF KNOWLEDGE

by

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Vocabulary Instruction: The State of Knowledge

Richard Bowker

SUMMARY

Recent studies in the areas of context-learning, imagery, cognitive style, and natural word learning are reviewed, and their implications for vocabulary instruction are assessed. The paper concludes with suggestions for further research.

Introduction

In 1968 a committee established by the National Council of Teachers of English completed a study entitled The State of Knowledge about the Teaching of Vocabulary (Petty et al., 1968). Their conclusion was that the teaching profession knows "little of substance about the teaching of vocabulary" (p. 84) except that some teaching of vocabulary is better than none. This single conclusion is hardly worthless, given the point of view that students' vocabularies will increase on their own, if only students can be persuaded to read. However it does suggest a paucity of firmly-established principles after decades of research and thousands of vocabulary-related studies (Dale et al., 1973). This paper will look at what has been learned since the NCTE study. Can any more be said now than was said then?

Limitations

There are some standard problems involved in discussing and comparing studies about vocabulary instruction. The first is the problem of defining when a word is "known". Most studies use a standardized multiple-choice test as their criterion. This becomes problematical when, for example, a study compares methods of teaching vocabulary, one of which would appear to be better suited for this kind of testing (e.g. Krevoy, 1978). Might the effectiveness of the method depend on the criterion of knowledge used?

A related problem is the different kinds of vocabularies a person can be said to possess: reading, speaking, listening, and writing, and the relationship among them. How interchangeable are these? Will a method that is effective in adding a word to one be effective in adding a word to another?

A third problem is the permanence of word knowledge. Studies are typically unable to test for word knowledge more than a few weeks after the end of the instructional period. It seems conceivable that one method might be superior for short term learning, while another might teach fewer words, but make them a permanent part of the student's vocabulary.

Finally, there is the question of the appropriateness of a method for a particular age. Vocabulary learning takes place throughout the school years, and probably throughout adult life. A method that is appropriate for the third grade might not be appropriate for high school, and vice versa.

Most studies do not try to deal with these problems, and as a result they constitute limitations on the conclusions the studies can reach. While some generalizations may be permissible, these limitations should be kept in mind in considering any study of vocabulary teaching methods.

1. Context

Several studies have looked at the benefits of learning a word in context as opposed, often, to learning a word plus definition in isolation. Some evidence cited in the NCTE study (e.g. Mattola, 1951) favors the teaching of words in isolation, but Petty et al. regard this as "something of a fluke" (p. 84).

Anderson and Kulhavy (1972) looked at the difference in word learning between college students who saw a word and its definition and made up sentences using the word, and students who saw the word and its definition and merely read the definition aloud three times. The posttest consisted of choosing which of several sentences was an example of the concept represented by the test word. Subjects who composed sentences did better than those who read the definitions aloud. In this study subjects were asked to make up their own context for a word, a typical activity in many vocabulary programs. No attempt was made to assess the appropriateness of the composed sentences; in any case, however, the task appeared to facilitate word learning.

In a similar study, Crist and Petrone (1977) compared word learning from contexts and definitions for two groups of college students. One group saw a series of fifteen unfamiliar words five times, each time with a different sentence using the word in context. The other group saw the words the same number of times, but each time the word was paired with its definition. Two posttests were given to both groups; one consisted of one-sentence contexts, the other of definitions. As expected, the context-group did better on the context posttest. The context group also did as well as the definition group on the definition posttest, suggesting that the context learning was superior. The results are obscured, however, by the fact that a number of different contexts were shown to the context group, while only one definition was shown to the definition group. The differences on the posttests might have been due to the differing amounts of information given to each group.

Hare (1975) studied the effectiveness of three methods of teaching vocabulary to third graders. The three methods were words in isolation, words with definitions, and words with definitions and in context. The contexts were provided by the students, and were spoken, not written. All three treatment groups were superior to the control group on a measure of reading vocabulary. Words with definitions and words with definitions and in context were superior to words in isolation as treatments; there was no significant difference between the first two. While this does not help show whether the context method or the definition method is to be preferred, the study does show both are preferable to the study of words in isolation, at least for these third graders.

Gipe (1978) studied four methods of vocabulary instruction with third and fifth grade students. She used an association method, in which the word was paired with familiar synonyms; a category method, in which the word was listed in a common category with familiar words; a context method, in which the word was used in

several sentences, and a question was asked based on the word's meaning and the student's experiences; and a dictionary method, in which the student looked up the word's meaning, wrote it down, and used the word in a sentence. The posttest was a cloze task. Results for both grades and both sexes showed the context method to be best, followed by the association, category, and dictionary methods. The author felt that her study supported the use of the context and association methods, but did not support the use of the category and dictionary methods. The format of the posttest may have had some effect on the results in this study, since the cloze task would appear to require familiarity with words as they are used in sentences, which may be considered a particular strength of the context method.

These studies in general appear to support Petty et al.'s conclusion that the evidence against the teaching of words in context was "something of a fluke". They offer somewhat stronger support for teaching a word in context along with its definition as opposed to teaching a word in context without a definition. This is in line with past studies that have shown the difficulties of unaided context learning (e.g. Gibbons, 1940; Sachs, 1943; Werner & Kaplan, 1950). Sachs, for example, remarks that students "possess an astonishing immunity from learning words in contexts" (Sachs, 1943, p. 462). There is also a suggestion that having the students produce contexts, instead of or in addition to having contexts provided for them, may be valuable by bringing students' own experiences and knowledge into play.

2. Imagery

Some research has been done recently on the value of "visual aids" in learning new words. These studies have been stimulated by the evidence that imagery enhances retention of learned material (Paivio, 1971).

In research primarily dealing with beginning readers, Samuels and others (Samuels, 1967; Singer et al., 1973-1974) have looked at the role of pictures in learning new words. In general the studies show that presenting words without pictures resulted in better learning, especially for poorer readers, than presenting words and pictures together. A "focal attention hypothesis" has been developed to explain these results. According to this hypothesis, the word-alone condition works better because it forces the child to focus on the word itself. The word-with-picture condition makes initial learning easier, but makes transfer of the learning more difficult, since the child focuses on cues that will not be present in the transfer task.

The focal attention hypothesis only has relevance for reading vocabulary; it does not suggest that pictures will not facilitate general learning or concept development, only that they will interfere with learning to read new words. There is some evidence (Bransford & Johnson, 1972; Rusted & Coltheart, 1979) that pictures can facilitate understanding prose passages. Rusted and Coltheart's study illustrates the distinction. Two groups of ten-year-olds read simple prose passages about unusual animals. One group was also shown a drawing of the animal. Afterwards each child was asked to say what he or she could remember about the animal. The group with pictures recalled significantly more. Each child was also asked to point to the name of the animal in a list that included acoustically similar names. The two groups performed equally well on this task. Thus pictures increased the children's general knowledge of the animals, but did not increase their ability to recognize the animals' names in print.

As with contexts, pictures may be either provided by the teacher or provided by the student. Bull and Wittrock (1973) looked at word learning under three conditions: 1. in which the child read a word and its definition and was asked to draw a pictorial representation of the word; 2. in which the child read the word and definition, wrote them out, and traced a picture representing the word provided by the experimenters; and 3. in which the child wrote out the word and definition repeatedly during the allotted interval. Fifth grade students were used in this study. The words used were all high-frequency nouns. The students were posttested a week later, using a three-choice test in which each choice was a correct definition of the word, but only one was a paraphrase of the meaning presented during the learning task. The "self-discovered images" group scored highest on the posttest followed by the "given images" group and the "verbal definitions" group. The authors suggest that "self-discovery of the image may allow the child to relate the definition to his own experience and to develop from it an image of high association value to him" (Bull & Wittrock, 1973, p. 292).

The value of pictures and imagery to vocabulary development appears to be less well established than the value of using words in context. It seems reasonable to conclude that encouraging students to produce images related to a novel word's meaning will facilitate its learning, and that teacher- or author-produced pictures may be of some value beyond the beginning stages of reading. It is interesting to note that both Rusted and Coltheart's and Bull and Wittrock's studies used only nouns. Nouns, of course, are more amenable to pictorial representation than other parts of speech. Morgan and Bonham (1944) found that nouns were easier to learn than other parts of speech in a task that involved remembering their foreign language equivalents. This may be because it is easier to form associates for nouns. It would be interesting to study whether self-discovered images facilitate the learning of verbs and adjectives.

3. Cognitive Style

Recent studies of aptitude-treatment interactions (Cronbach & Snow, 1977) have suggested that different instructional methods might be preferable for different kinds of students. In particular, research on hemispheric specialization in the brain (Kinsbourne, 1978) and on cognitive style (e.g. Witkin et al., 1977) has indicated the existence of two approaches to problem-solving: a "left-brain", analytic, sequential approach, and a "right-brain", holistic approach. A recent study (Krevoy, 1978) looked at these two approaches in the context of vocabulary learning.

Krevoy used a verbal reasoning and a picture completion test to separate a group of college students into analytic and holistic subgroups. Students who scored about the same on both tests were dropped from the study, so that only students who showed a definite tendency towards one cognitive style were retained. Instructional methods in word learning suitable for each style were devised. The analytic method consisted of presenting each word and its definition and using the word in a sentence. The holistic method consisted of using all the words in a story, so that the student had to derive the meanings from the context.

An additional element in the study was an investigation of the benefits of self-produced contexts. Half the group using the analytic method also had to write their own sentences using the words. Half the group using the holistic method also had to insert the words into another story that had blanks where the words were supposed to go.

Students were assigned to methods so that equal numbers of each cognitive style received each treatment. They were posttested immediately afterwards and a week later, by being asked to write a synonym or brief definition of each word.

Results showed that the analytic group did better using the analytic method, and the holistic group did better using the holistic method: that is, there was an aptitude-treatment interaction. Students who generated their own contexts did better than students who did not. Finally, the analytic method in general produced higher scores than the holistic method.

These results suggest that different approaches to teaching words may be more or less successful with students having different cognitive styles, and that assessment of these cognitive styles might be a useful first step in an individualized program of vocabulary instruction.

The findings with regard to self-generated contexts are consonant with other studies discussed above. It seems clear that this is a useful way to fix a word's meaning in a student's mind. The results with regard to the superiority of the analytic method should probably be interpreted with caution. The author suggests that this superiority may be due to an educational and cultural bias in favor of the analytic style. It is at least as likely that the analytic nature of the posttest contributed to the result. Presumably giving the definitions of the words during the treatment to one group will assist that group on a posttest that asks for definitions. It seems reasonable, however, that the definition be given at some point during the treatment of a novel word, to give some means of ordering the impressions gained from seeing the word in context, and to avoid misunderstandings that may develop from inappropriate generalizations from context.

4. Natural Word Learning

A considerable amount of study has been devoted in the past few years to the process of acquiring word meanings in the child. Most of the words we know were not taught to us in school, or looked up in a dictionary. How did we learn them? Can this material word-learning facility be used or guided in a conscious program of vocabulary development?

One difficulty with seeking educational applications of findings in this area is that most of the work has been done with very young children, using words like more and less. It is not clear that adults (or adolescents) learn words in the same way as children, if only because adults are more aware of the process of word learning.

Another difficulty is the lack of a generally-accepted theory of how children acquire language. The most-commonly cited theory of word learning is the semantic features hypothesis (Clark, 1973). This hypothesis states that children learn the meanings of words one feature at a time. Thus a child might first learn that wide has to do with size, but this would not enable him or her to distinguish wide from tall, long, or big. Only later will the child be able to differentiate the words by, presumably, understanding that wide refers specifically to the horizontal dimension.

While it seems obvious that a child does not learn the entire meaning of a word at once, it is not clear that the semantic features hypothesis is an accurate description of what goes on in a child's mind as a word is being learned, and the theory remains controversial.

A study by Carey (1978) gives some insights into the process of natural word learning and some of the difficulties involved in understanding it. In a natural context, she introduced the word chromium with the meaning "the color olive" to a group of nursery school students, and then observed over several months their uses of and reactions to the word. Chromium was never specifically defined to the children, in order to avoid explicitly calling attention to the new word. After only a couple of exposures to the word most of the children appeared to be aware of its existence as a word, and showed signs of beginning to reorder their conceptual domain of the colors. The working out of the exact place of chromium in this revised domain was quite extended, however, and was not complete for many of the children after several months. Some children, for example, decided that chromium was a synonym of green. Other children could pick out olive when asked what color chromium was, but could not come up with the word on their own.

Carey terms the initial speedy assimilation of the word "fast mapping". She notes that, if the extended full mapping required several months, then the young child is in the process of working out the meanings of as many as 1600 words at a time. The fast mapping allows the child to retain these fragile new words in his or her lexicon while this extended learning process is being carried out.

From the point of view of vocabulary teaching, it would be interesting to carry out a similar study in which the children are actually told the meaning of chromium, instead of their having to infer it, to see if this shortens the period required for full mapping and reduces the misconceptions the children develop.

Based on this and other studies of children in the process of learning words, Carey suggests a variation of the semantic features hypothesis of word learning, in which the child must both discover the features and map them onto relevant words. A child might learn deep and shallow as applied to ends of swimming pools, for example, but not see the similarity between pools and holes that would allow the words also to be applied to holes. What the child probably does is acquire haphazard examples of the uses of a word and attempts tentative generalizations based on these examples. The child may first apply deep only to other swimming pools, and only after several examples apply it to other things like holes that do not require a liquid medium.

The implication of this theory for teaching vocabulary is that it is the teacher's job to provide the examples, to put some order on the haphazard accretion of information that would otherwise take place. It also suggests that while self-generated contexts may be useful for the initial insertion of the word into the student's conceptual framework, this fast mapping may not be sufficient to provide full understanding of the word. The word might go into the student's comprehension vocabulary (so that he or she could get it right on a posttest), but not into his or her speaking or writing vocabularies. To get beyond this, more work with the word might be required.

The theory also suggests that everyone's lexicon contains a great number of incompletely-understood words, words whose meanings are represented by a muddle of vaguely-remembered examples and only the most general semantic features.

Saturnine has something to do with peoples moods or expressions; tendentious has to do with writing or speaking -- perhaps it is related to sententious? These fast-mapped words, different for each person, are conceivably the ones which would most benefit from formal vocabulary instruction.

These conjectures and suggestions accurately reflect the inconclusive nature of the evidence in this field. As research continues, however, one can expect that it will have considerable impact on methods of vocabulary instruction.

Summary

It is clear that more is known now about vocabulary instruction than was known in 1968. Yet it is also clear that no one method of instruction has conclusively been demonstrated to be the best for all students. The most reasonable approach, therefore, might be an eclectic one, in which students are introduced to words in a variety of ways, and are asked to perform a variety of tasks with them (e.g. drawing pictures, using the words in sentences). Their knowledge of a word should also, ideally, be tested in several different ways, to ensure that their understanding extends beyond simply knowing a synonym or a typical context.

Many questions, of course, remain unanswered. Topics for future research might include:

1. What are the benefits of teaching roots and affixes? This method of vocabulary instruction is widely considered to be superior because it enables students to generalize their knowledge to other words. Yet Deighton (1959) among others suggests that this approach has limited usefulness because a word's meaning is often more than the sum of its parts, because so many affixes have more than one meaning, etc. This dispute seems amenable to objective research.

2. Does it make a difference what words a student is taught? Most vocabulary programs introduce words in a particular sequence, based on their frequency of use, personal judgments of their difficulty, or some other criterion. Certainly students shouldn't waste time studying words they already know (although Carey's theory suggests that this knowledge might not be very full, and further study might be in order); would it make any difference if they studied words that appeared to be too difficult for them? If the level of difficulty does make a difference, what is the best way to determine this level?

It is interesting to note in this regard that, for experimental design reasons, most vocabulary studies use words the researcher is certain the subjects will not know. Would their results be different if they used somewhat easier words, which the subjects might know vaguely but not really understand?

3. How transferable is word knowledge learned in different media? Assuming no pronunciation or decoding difficulties, one might still expect that hearing a word would cause a different kind of learning from reading it. Is this difference worth worrying about?

4. Is cognitive style an important factor in word learning before college? Krevoy's study should certainly be extended, both to include other ages and other aspects of word knowledge. For example, do holistic individuals perceive and use words differently from analytic individuals? Is there a preferable form of instruction for students who do not clearly possess one style or the other?

Answers to questions like these would greatly extend our understanding of how to teach words.

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